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The association of earnings quality with corporate performance: evidence from the emerging market of China

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The association of earnings quality with corporate performance: evidence from the emerging market of China

Abstract

Purpose: The aim of this paper is to investigate the association of earnings quality with corporate performance of publicly listed firms of China and tries to provide a new explanation. Poor earnings quality is normally characterized by unhealthy profitability and/or untrue financial information, which leads to a misallocation of capital and low corporate performance. The largest emerging economy of China has experienced a fast and fluctuant growth, while the companies have been thought of low earnings quality.

Design/methodology/approach: Initial univariate and multivariate analyses are conducted using four earnings quality measures and either accounting-based corporate performance or market-based corporate performance. Further analyses apply unmanaged earnings, earnings-increase management and financially distressed firms.

Findings: The authors find that low earnings quality is associated with high corporate performance for the Chinese publicly listed firm in their sample period. Further evidence shows that earnings management is only a contributor to the negative relationship, not its main driver. They argue that the negative association of earnings quality with corporate performance is a phenomenon of a new emerging market within an economy booming period, particularly in China.

Research limitations/implications: The results and argument of this paper may not totally follow the traditional literature. But they provide a new research question that requires further studies.

Originality/value: In theoretical discussion, this paper partitions earnings quality into two components: One results from reporting accuracy and the other results from firm's operating outcome. In empirical analyses, this paper examines both accounting-based performance and market-based performance, and both managed earnings and unmanaged earnings.

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The Association of Earnings Quality with Corporate Performance: Evidence from the Emerging Market of China

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This paper investigates the association of earnings quality with corporate performance using a sample of publicly listed firms on the Shanghai and Shenzhen stock markets from 2004 to 2010. We find that low earnings quality is associated with high corporate performance. There is a suspicion that earnings management may distort earnings quality and manipulate earnings upwards, and thus lead to the negative relationship between earnings quality and corporate performance. However, our further evidence, obtained by examining unmanaged earnings, earnings-increase management and financially distressed firms, shows that earnings management is only a contributor to the negative relationship, not its main driver. We argue that the negative association of earnings quality with corporate performance is a phenomenon of a new emerging market with a booming economy, particularly in China.

Keywords: Earnings quality; earnings management; corporate performance; emerging market; China

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The Association of Earnings Quality with Corporate Performance: Evidence from the Emerging Market of China

Abstract

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Design/methodology/approach – Initial univariate and multivariate analyses are conducted using four earnings quality measures and either accounting based corporate performance or market based corporate performance. Further analyse apply unmanaged earnings, earnings-increase management and financially distressed firms.

Findings – We find that low earnings quality is associated with high corporate performance for the Chinese publically listed firm in our sample period. Further evidence shows that earnings management is only a contributor to the negative relationship, not its main driver. We argue that the negative association of earnings quality with corporate performance is a phenomenon of a new emerging market within an economy booming period, particularly in China.

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Paper type: Research paper

1. Introduction

Earnings quality has drawn a great deal of attention from academics and entrepreneurs because it incorporates much more information on corporate operations and financial reporting, and may consequently impact corporate performance. Two types of definition of earnings quality are frequently referenced. One type of definition concerns the degree to which the quantity of earnings reflects a firm's economic reality (Dechow and Schrand, 2004; Chan et al., 2006; Hodge 2003). In other words, earnings quality denotes that the financial statement reports accurately and impartially the firm's corporate operating status and financial position. In this definition, a close match between earnings and cash flow is viewed as high quality, because earnings may be manipulated by inflating accruals. The other type of definition recognizes earnings quality as the degree to which earnings persist or are sustained into the next period (Richardson et al., 2005, 2006; Revsine et al. 1999). In this definition, high variation and volatility of earnings is viewed as low quality, because earnings uncertainty is a risk for corporate operation and adds to the cost of capital.

The relevant literature claims that having high-quality earnings is a desirable trait in companies. Poor earnings quality is characterized by unhealthy profitability and/or untrue financial information, and is thus detrimental to investors and other users of financial statements. Low-quality earnings can lead to a misallocation of capital, and may generate inappropriate outcomes for contracts that use accounting data as inputs (Schipper and Vincent 2003). Low-quality earnings also introduce an information risk to investors, and thereby increase the cost of capital (Francis et al. 2004). The positive relationship between earnings quality and corporate performance is theoretically proved.

However, empirical result seems not always to provide evidence that high earnings quality is associated with high corporate performance and vice versa. Chan et al. (2006) examine the market valuation of earnings quality. They find that increased earnings

accompanied by high accruals suggest low earnings quality. Penman and Zhang (2002) document that growth firms in sales or net operating assets are accompanied with lower earnings quality. In this research on Chinese publically listed firms, we find that earnings quality in majority measures has negative relations with corporate performance. We argue that this negative association can be explained by the following theoretical insight.

Regardless of the various definitions of earnings quality, several measures have been popularly employed in examining it: accruals quality, earnings persistence, earnings predictability, earnings smoothness, value relevance, timeliness, and conservatism (Francis et al., 2004; Dechow et al., 2010). The earnings quality measures can be estimated by either use of firm-year specific time series regression or use of industry-based cross-sectional regression. Both methods are constructed on the principle of generating benchmark earnings for the calculation of earnings variations or estimated errors.

The deviation from reported earnings to the benchmark earnings consists of two components, represented by the formula: reported earnings – benchmark earnings = (reported earnings – real earnings) + (real earnings – benchmark earnings). One component is the difference between reported earnings and real earnings, which results from reporting accuracy. The other is the difference between real earnings and the benchmark, which results from a firm's operating outcome. Dechow et al. (2010) state that earnings quality is jointly determined by the relevance of underlying fundamental performance and by the ability of the accounting system to measure performance. Thus, we contend that any test of earnings quality using the aforementioned measures is a joint test of the firm's fundamental performance and financial reporting accuracy.

The benchmark earnings generated by the models are treated as desirable, because when the deviation from the reported earnings to the benchmark earnings is small, the earnings quality is deemed to be high; otherwise the earnings quality is deemed to be low. If

we ignore the question of the rationale for benchmark earnings being desirable unconditionally, the earnings quality is only relevant to reported earnings. However, the reported earnings are a joint function of corporate operation and financial reporting, which determine earnings quality (Dechow et al., 2010).

On the corporate operating side, either significant revenue increases or decreases or fluctuates will lead to actual earnings deviation from benchmark earnings. Those sorts of earnings are uncertain, less predictable, low persistence and showing low quality. On the financial reporting side, significant increased accruals (represented as discretionary accruals) can either result from the growth of sales and preparation for the growth of sales or from earnings management that uses accruals to inflate and smooth earnings.

In the new emerging market of China, the mainstream of firms has remarkable expansion in production and sales. This can be observed from the growth of the national economy at a rate of 10% on average in the past ten years. Yet, earnings quality has been recognized as low due to uneven expansion of production and possible earnings management. We argue that low earnings quality could be a by-product of the fast growth of the economy in an emerging market. The upward trend of the economy dominates the negative effect of earnings volatility and reporting inaccuracy. Thus low earnings quality can be accompanied by high corporate performance.

Keeping this argument in mind, we investigate the relations between earnings quality and corporate performance for firms publicly listed on the Shanghai and Shenzhen stock markets from 2004 to 2010. Firstly, by using accounting-based measures of corporate performance, our empirical results indeed show that low earnings quality is associated with high corporate performance. Next, we eliminate the possible earnings management component from the corporate performance. The unmanaged corporate performance is still negatively associated with earnings quality, although the significance is slightly lower.

Furthermore, we classify companies as having earnings-increase management and earnings-decrease management. The negative association of earnings quality with corporate performance is found in both classes of companies. Finally, we employ market-based measures of corporate performance in the robustness tests. The negative association of earnings quality with corporate performance is still estimated on several earnings quality measures, although there is one exception. We also compare the earnings quality and firm performance of financially distressed firms with those of normal firms. The earnings quality and firm performance of financially distressed firms are significantly lower than those of normal firms.

To the best of our knowledge, we are extending the literature by conducting a systematic study of the relation between earnings quality and corporate performance for Chinese listed firms. The contribution of this research is that we are the first to claim, and provide evidence, that earnings quality is negatively associated with corporate performance in the new emerging market of China. If judged according to the mainstream opinion of the existing literature, that earnings quality is positively associated with corporate performance, our findings may seem unusual. We argue, with our further evidence, that the association of low earnings quality with high corporate performance is probably an inherent phenomenon of emerging markets. The fast and fluctuating growth is a main driver of the coexistence of low earnings quality and high corporate performance in emerging markets such as China. Emerging markets are a large component of the world market. Identifying the phenomena that characterize an emerging market, or the emerging period of a market, would rich emerging market literature.

The rest of this paper is organized as follows: Section 2 reviews the relevant literature and describes institutional background. Section 3 develops the measures of earnings quality

and corporate performance. Section 4 presents and analyses the empirical results generated from various modellings. Section 5 concludes the paper.

2. Literature and research hypotheses

No consensus exists in the literature about the concept of earnings quality. Dechow and Schrand (2004) state that a high-quality earnings number accurately reflects a company's current operating performance and is a good indicator of future operating performance. Financial statements will be less useful when the reported accounting earnings do not reflect the firm's financial activity throughout the reporting period (Healy and Wahlen, 1999). Dechow and Schrand (2004) also indicate that high-quality earnings should be easily convertible into cash. This represents a high correlation between earnings and cash flow and low accruals volatility.

Ball and Brown (1967, 1968) contend that high earnings quality should be valued on the equity market. Thus, they use market responses to earnings news to refer to earnings quality. Schipper and Vincent (2003) view earnings quality in relation to Hicksian income, that is the maximum amount that can be consumed consistent with the maintenance of wealth. According to Kirschenheiter and Melumad (2004), high-quality earnings are more informative to the long-run value of the firm. Revsine et al. (1999) consider that earnings are of higher quality when they are sustainable. Richardson et al. (2005) treat earnings quality as the degree to which earnings performance persists into the future.

Francis et al. (2005) state that earnings quality is influenced by two types of factors: those that reflect innate features of business models and operating environments, and those that reflect the financial reporting process. Dechow et al. (2010) set a framework for thinking about earnings quality: Reported earnings = f (X), where X is a firm's fundamental performance and f represents the accounting system that converts the unobservable X into

observable earnings. Thus, earnings quality is impacted by both the firm's fundamental performance and the ability of the accounting system to measure performance.

In practice, earnings quality measures can be estimated using the firm-year specific method (Francis et al., 2004; Dechow and Schrand, 2002). This method performs a time series regression and treats firm post earnings (or cash flow and accruals etc.) as benchmarks. Alternatively, earnings quality measures are estimated using cross-sectional regression methods (McNichols and Stubben, 2008; Cornett et al. 2008). This method is based on industrial identification and treats the average of earnings (scaled by an indicator such as total assets) in the industry as a benchmark. The estimated coefficients (such as earnings persistence), forecasting errors (such as discretionary accruals) or adjusted R-squares (such as value relevance) generated in the regressions could represent earnings quality. Therefore, the deviation of current earnings from benchmark earnings, which is reflected in the parameters, is the key determinant of the level of earnings quality.

Because earnings quality is impacted by both the firm's fundamental performance and the accuracy of accounting in reporting this performance, it is possible that low earnings quality is accompanied with high corporate performance. Dechow and Schrand (2004) indicate that companies in growing industries will typically have high accruals and large estimation errors. High accruals and large estimation errors imply deviation of earnings from cash flow and underlying volatility in the company's operation, and thus low quality earnings. In particular, companies with extensive growth options are likely to have low-quality earnings that are practically irrelevant for evaluating current performance and predicting future performance. Thus, we set up our research hypotheses:

H1: In an emerging market experiencing an economic boom, it is possible that high corporate performance is associated with low earnings quality due to fluctuating growth.

H2: Earnings management may distort earnings quality and manipulate corporate performance upwards. However, in an emerging market, earnings management is not necessarily the main driver of high corporate performance and low earnings quality.

H3: The association of low earnings quality with high corporate performance is probably an inherent phenomenon of an emerging market. Fast and fluctuating growth results in the coexistence of low earnings quality and high corporate performance in the emerging market of China.

3. The measures of earnings quality and corporate performance

The measures of earnings quality

Earnings quality can be measured from various dimensions. Schipper and Vincent (2003) propose several earnings quality measures, including earnings persistence, predictability, and variability, which are derived from time series properties of earnings. Francis et al. (2004) classify seven earnings quality measures as accounting-based or market-based, depending on the underlying assumptions and the data type used in the computation.

Based on current literature and data availability, this study employs the following four earnings quality measures: accruals quality, earnings persistence, earnings predictability, and discretionary accrual. Kothari et al. (2005) indicate that earnings management most likely takes place at the end of the financial year, suggesting that the manipulation of accounting numbers occurs simultaneously across firms. Firms therefore are exposed to a clustering effect in total accruals. Thus, the cross-sectional method may dramatically reduce the efficiency of panel estimates. The firm-year specific method treats the firm as its own benchmark and mitigates concerns that differences between firms in a given industry give rise to noisy measures in the constructs (Francis et al. 2004). Therefore, in this research all

the earnings quality measures are estimated by the firm-year specific method and by a rolling five-year window.

Accruals quality

The gap between earnings and cash is accruals. Earnings that map more closely into cash flows are more desirable. One role of accruals is to shift or adjust the recognition of cash flows over time, so that the adjusted number can better reflect firm performance. The measure of accruals quality we use is based on Dechow and Dichev's (2002) model relating total current accruals to the lagged, current, and future cash flows from operations, represented as equation (1):

$$\frac{TCA_{j,t}}{Assets_{j,t-1}} = b_0 + b_1 \frac{CFO_{j,t-1}}{Assets_{j,t-1}} + b_2 \frac{CFO_{j,t}}{Assets_{j,t-1}} + b_3 \frac{CFO_{j,t+1}}{Assets_{j,t-1}} + \varepsilon_{j,t} \quad (1)$$

where $TCA_{j,t}$ represents the firm *j*'s total current accruals in year *t*; $Assets_{j,t-1}$ is firm *j*'s total assets in year $t-1$; $CFO_{j,t}$ is firm *j*'s cash flow from operations in year *t*.

The accruals quality is represented by the standard deviation of estimated residual σ ($\hat{\varepsilon}_{j,t}$). Large (small) values of σ ($\hat{\varepsilon}_{j,t}$) correspond to lower (higher) accruals quality and lower (higher) earnings quality, because there is less (more) precision about the mapping of current accrual into current-period, last-period and next-period cash flows.

Earnings persistence

Earnings persistence captures earnings sustainability, and thus persistent earnings are viewed as desirable because they are recurring (Francis et al. 2004). To measure persistence, researchers generally conduct a regression of the future value of the variable on its current value (Dechow and Schrand 2004). Kormendi and Lipe (1987) apply firm-level regressions on current earnings to estimate the earnings persistence. The present study employs the measure in Kormendi and Lipe (1987) and uses the following equation:

$$\frac{Earn_{j,t}}{Assets_{j,t-1}} = \delta_0 + \delta_1 \frac{Earn_{j,t-1}}{Assets_{j,t-1}} + v_{j,t} \quad (2)$$

where: $Earn_{j,t}$ represents firm *j*'s net income before extraordinary items in year *t*; and $Earn_{j,t-1}$ is firm *j*'s net income before extraordinary items in year $t-1$.

The measure that captures earnings persistence is based on the slope-coefficient estimate δ_1. Values of δ_1 close to 1 (or greater than 1) indicate highly persistent earnings, while values close to zero imply highly transitory earnings. Persistent earnings are viewed as higher quality, while transitory earnings are viewed as lower earnings quality.

Earnings predictability

Earnings predictability refers to the ability of earnings to be predicted in a time interval (Boonlert-U-Thai et al. 2006). Dichev and Tang (2009) investigate the relationship between earnings volatility and earnings predictability, and find a negative relationship between earnings volatility and earnings predictability. Francis et al. (2004) measure earnings predictability using the square root of the estimated error-variance from the earnings-persistence equation. In line with Francis et al. (2004), this study measures earnings predictability using the square root of the error variance from the equation of earnings persistence (2):

$$Pred_{j,t} = \sqrt{\sigma^2(\hat{v}_{j,t})} \quad (3)$$

where: $\sigma^2(\hat{v}_{j,t})$ represents the estimated-error variance of firm *j* in year *t*, calculated from equation (2).

Large values of $\sigma^2(\hat{v}_{j,t})$ imply less predictable earnings. More predictable earnings are viewed as desirable and of higher earnings quality, while less predictable earnings are viewed as being of lower quality.

Discretionary accrual

Total accruals can be divided into nondiscretionary accruals (or normal accruals) and discretionary accruals (or abnormal accruals). Discretionary accruals are the component that cannot be explained by accounting fundamentals. The use of discretionary accruals as a measure of earnings quality is based on the view that discretionary accruals are not well explained by accounting fundamentals (fixed assets and revenues), and are inversely related to earnings quality (Francis et al. 2006).

In practice, the discretionary accruals are usually first estimated using Jones' (1991) model to obtain the coefficients *k1*, *k2*, and *k3*; and then using a modified Jones model (Dechow et al. 1995) to calculate nondiscretionary accruals. Finally, the difference between total accruals and nondiscretionary accruals is discretionary accruals, as represented in the equations (4), (5), and (6).

$$\frac{TA_{j,t}}{Assets_{j,t-1}} = k_1 \frac{1}{Assets_{j,t-1}} + k_2 \frac{\Delta Rev_{j,t}}{Assets_{j,t-1}} + k_3 \frac{PPE_{j,t}}{Assets_{j,t-1}} + \omega_{j,t} \tag{4}$$

$$NDA_{j,t} = \hat{k}_1 \frac{1}{Assets_{j,t-1}} + \hat{k}_2 \frac{\Delta Rev_{j,t} - \Delta AR_{j,t}}{Assets_{j,t-1}} + \hat{k}_3 \frac{PPE_{j,t}}{Assets_{j,t-1}} \tag{5}$$

$$DA_{j,t} = \frac{TA_{j,t}}{Assets_{j,t-1}} - NDA_{j,t} \tag{6}$$

where: $TA_{j,t}$ represents the total accruals of firm *j* in year *t*, which is equal to total current accruals plus depreciation; $Rev_{j,t}$ is the revenue of firm *j* in year *t*; $PPE_{j,t}$ is the gross property, plant and equipment; $AR_{j,t}$ is the accounting receivable of firm *j* in year *t*; $NDA_{j,t}$ represents nondiscretionary accruals; and $DA_{j,t}$ represents discretionary accruals.

Both positive and negative discretionary accruals that are significantly different from zero represent low earnings quality. To keep the description consistent, we use the absolute value (abs) of discretionary accruals as an earnings quality measure. Large (small) discretionary accruals *(*abs) equate to low (high) earnings quality.

The measures of corporate performance

We firstly employ four accounting-based measures of corporate performance. EBIT/assets (earnings before interest and tax scaled by assets) is a typical measure of profitability relative to total capital. It is commonly used to examine corporate performance (Cornett et al. 2008). EBIT/sales is an alternative measure of profitability scaled by value of sales, and represents profitability in terms of a firm's activity of sales. Because EBIT consists of CFO and nondiscretionary accruals (NDA) and discretionary accruals (DA), managers can influence EBIT through their assumptions concerning accruals; that is, their manipulation of discretionary accruals. In order to obtain a performance measure that is relatively free from manipulation, we adopt an unmanaged performance measure that was put forward by Cornett et al. (2008): (EBIT – discretionary accruals)/assets or equivalently EBIT/assets – %DA. Alternatively, we design another unmanaged performance measure that is (CFO + nondiscretionary accruals)/assets or equivalently, CFO/assets + %NDA[1].

We further employ a market-based measure of corporate performance in a robustness test: Tobin-Q, which is a ratio of market value of equity plus net book value of liability to book value of equity plus net book value of liability. Because, there are tradable and non-tradable shares for a majority of firms, we adopt two types of Tobin-Q. In Tobin-Q1, the market value of equity is the market price multiplied by total number of shares. In Tobin-Q2, the market value of equity is the market price multiplied by total number of shares plus book value of non-tradable shares.

Sample and summary statistics

Our initial sample comprises the firms that issued A shares and were listed on either the Shanghai or Shenzhen stock exchanges for at least six consecutive years from 1999 to 2010[2]. We eliminate firms that have an incomplete data set and thus did not qualify for our analysis. We eliminate financial firms, because they are subject to special regulations and are

characterized by a unique capital structure. We also exclude firms classified by the China Securities Regulatory Commission (CSRC) as being "particular treatment" (PT) firms. PT firms are identified as having suffered a loss for three consecutive years and have heavy restrictions imposed on their reporting and share trading. Most PT firms are suspended from business, and further delisted or merged. However, we have included "special treatment" (ST) firms. ST firms are identified as having experienced negative profit for two consecutive years, but are still allowed to continue operating like normal firms. Most ST firms recover from financial distress, but others may go on to become PT firms.

Since the calculation of earnings quality measures requires yearly increments or the prior year's data or both the prior and subsequent years' data, and the measures are generated by regression modellings in a rolling five-year window, the number of examinable observations shrinks. The final sample consists of 1,176 firms with 7,921 firm-year observations reported from 2004 to 2010, which constitutes an unbalanced panel data set.

The majority of data are collected from the China Stock Market and Accounting Research Database (CSMAR) created by the GTA Information Technology Company and the University of Hong Kong. The supplementary data come from a series of Shanghai Stock Exchange Statistical Annuals, Shenzhen Stock Exchange Fact Books and firms' annual reports available on their homepages. Some errors have been corrected by checking various data sources.

In order to avoid extreme outliners, we follow the practice put forward by Francis et al. (2004) to winsorize the values of earnings quality measures, corporate performance measures, and control variables that are represented by ratios to the 99 percent and 1 percent values. Panel A of Table I presents descriptive statistics of earnings quality. As Cornett (2008) indicates, discretionary accruals must be reversed at some point. Due to the summation of positive and negative discretionary accruals generated from auto-regression, the average

value should be near zero. The average discretionary accruals in our sample are small, at 0.51 percent of assets. The average absolute value of discretionary accruals is relatively large, at 6.76 percent of assets.

Table I. Summary statistics of earnings quality measures, corporate performance and control variables

Variable	Definition	Mean	Median	Standard deviation	25th percentile	75th percentile
Panel A: Earnings quality measures						
	Accruals quality	0.0418	0.0266	0.0522	0.0117	0.0532
	Earnings persistence	0.3677	0.2157	1.1334	–0.1429	0.7396
	Earnings predictability	0.0571	0.0248	0.1350	0.0113	0.0572
	Discretionary accrual	0.0051	–0.0001	0.1376	–0.0361	0.0358
	Absolute value of discretionary accrual	0.0676	0.0360	0.0983	0.0141	0.0801
Panel B: Corporate performance measures						
	EBIT/assets	0.0264	0.0329	0.1421	0.0100	0.0665
	EBIT/sales	0.0254	0.0542	0.5707	0.0161	0.1252
	EBIT/assets – %DA	0.0239	0.0349	0.1998	–0.0225	0.0926
	CFO/assets + %NDA	0.0178	0.0210	0.1856	–0.0424	0.0806
	Tobin-Q1	1.8355	1.3307	1.4500	1.0440	2.0012
	Tobin-Q2	2.3902	1.7159	2.1464	1.2157	2.6558
Panel C: Control variables						
	Total assets (million)	5700	2095	24582	1007	4474
	Leverage (liability/assets)	0.5723	0.5463	0.3032	0.4024	0.6759
	Growth of sales	0.1903	0.1278	0.5044	–0.0367	0.3133
	Top5 ownership (%)	50.57	50.94	15.23	39.62	61.20
	Dummy for state being the largest shareholder	0.5098	1.0000	0.4999	0	1.0000
	Dummy for A-share firms issuing B-shares	0.0981	0	0.2975	0	0
	Dummy for ST firms	0.1348	0	0.3415	0	0

Notes: The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. Our initial sample comprises firms that issued A shares and were listed on either the Shanghai or Shenzhen stock exchanges for at least six consecutive years from 1999 to 2010. Since the calculation of earnings quality measures requires yearly increments or the prior year's data or both prior and subsequent years' data, and the measures are generated by regression modellings in a rolling five-year window, the number of examinable observations shrinks. The final sample consists of 1,176 firms with 7,921 firm-year observations reported from 2004 to 2010, which constitutes an unbalanced panel data set.

All earnings quality measures have larger means than medians, with each having almost doubled in value. This implies that the values of earnings quality measures are right skewed. The standard deviations of all earnings quality measures are larger than their means. For instance, the standard deviation of accruals quality is 0.0522, while its mean is 0.0418; the standard deviation of earnings persistence is 1.1334, while its mean is 0.3677. This large standard deviation indicates the high dispersion of earnings quality of Chinese listed firms.

Panel B of Table I presents corporate performance measures. The EBIT/assets and EBIT/sales are based on reported earnings, and are also called managed earnings. The assets-scaled EBIT is more concentrated than the sales-scaled EBIT, because the former in comparison with latter has a larger mean, lower standard deviation, and smaller spread between the 25th percentile and 75th percentile. The corporate performance measures EBIT/assets – %DA and CFO/assets + %NDA are based on unmanaged earnings, since discretionary accruals are not included in the earnings. Because discretionary accruals can be either positive or negative, the unmanaged earnings are not necessarily smaller than managed earnings. The two Tobin-Qs have larger mean than standard deviation, suggesting that market-based measures of performance are less dispersed than accounting-based measures.

Hitherto, the large raw values of earnings persistence represent high earnings quality, and the large raw values of other earnings quality measures represent low earnings quality. Francis et al. (2004) put a negative sign on the measures that large values represent high earnings quality. Therefore all measures become that large values represent low earnings quality. For ease of understanding and discussion, we hereafter give negative signs to the raw values of accruals quality, earnings predictability, and absolute value of discretionary accruals. Therefore, all earnings quality measures in our study become the large the high earnings quality.

Table II arranges the correlation coefficients. The top triangle matrix represents the correlation between corporate performance measures. We can see that the correlation coefficients between any pair of accounting-based measures and between the two market-based measures are all positive and significant at better than 1 percent levels. Only the market-based measures have a negative correlation with unmanaged earnings, but they are insignificant. On the bottom right-hand side, a triangle matrix represents the correlation

coefficients between any pair of earnings quality measures. All the correlation coefficients are positive and at 1 percent significance or better.

Table II. Correlation coefficients between corporate performance and earnings quality measures

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
EBIT/asset	(1)									
EBIT/sales	(2)	0.747								
		(.001)								
EBIT/assets – %DA	(3)	0.863	0.624							
		(.001)	(.001)							
CFO/assets+ %NDA	(4)	0.362	0.244	0.379						
		(.001)	(.001)	(.001)						
Tobin-Q1	(5)	0.047	0.048	0.011	-0.015					
		(.001)	(.001)	(.318)	(.171)					
Tobin-Q2	(6)	0.022	0.029	-0.009	-0.023	0.919				
		(.053)	(.010)	(.443)	(.142)	(.001)				
Accruals quality	(7)	0.046	-0.002	0.053	-0.014	-0.202	-0.244			
		(.889)	(.001)	(.250)	(.002)	(.001)	(.001)			
Earnings persistence	(8)	-0.084	-0.098	-0.057	-0.019	-0.043	-0.034	0.043		
		(.001)	(.001)	(.001)	(.084)	(.000)	(.003)	(.001)		
Earnings predictability	(9)	-0.024	-0.028	-0.012	-0.093	-0.249	-0.335	0.398	0.047	
		(.033)	(.013)	(.275)	(.001)	(.001)	(.001)	(.001)	(.001)	
Discretionary accrual (abs)	(10)	0.014	0.012	0.002	-0.049	-0.086	-0.117	0.336	0.006	0.195
		(.229)	(.286)	(.0.875)	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)

Notes: Values in parentheses are probabilities of significances. The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. The top triangle matrix represents the correlation between corporate performance measures. The bottom right-hand triangle matrix represents the correlation coefficients between any pair of earnings quality measures. The rectangle matrix between the two triangles represents the correlation coefficients between earnings quality measures and corporate performance measures. The sample consists of 1,176 firms with 7,921 firm-year observations.

The rectangle matrix between the two triangles represents the correlation coefficients between earnings quality measures and corporate performance measures. Earnings persistence and earnings predictability have negative correlations with all corporate performance measures and most of them are at the 5 percent or better significance level. The other earnings quality measures have more negative correlation coefficients than positive correlation coefficients with corporate performance measures, while the positive coefficients are insignificant. Overall, the negative correlation coefficients dominate the rectangle matrix.

High earnings quality is related to low corporate performance, and can be viewed in most of the cells.

4. Empirical analyses

Model design

Earnings quality has an association with corporate performance. In addition to earnings quality, many factors impact on corporate performance and are associated with earnings quality. We chose several important factors as control variables to establish an environment commonly determined by those factors, so that we could insulate the effects of those variables from that of earnings quality.

Firm size is often selected as a control variable in research. On the one hand, firm size is related to operational efficiency and the ability to protect firms from risk. On the other hand, firm size is correlated with the amount of cash flow and accruals, which are inherently linked to earnings quality. We use total assets to represent firm size and the logarithm of total assets as an independent variable in our modelling.

Leverage is another popularly chosen control variable. Leverage represents the trade-off between tax benefit and bankruptcy cost. In particular, the level of leverage reflects the firm's potential risk, and accordingly influences the firm's reporting and accrual accounting policies. The leverage here is the ratio of total liability to total assets.

The agency issue is always detected as a factor influencing corporate performance, financial reporting, and earnings quality, while ownership concentration is considered a determining factor of the agency issue. For example, one argument states that high ownership concentration can reduce agency costs by aligning the interests of owners and managers (Heugens et al., 2009; Shleifer and Vishny, 1986 and 1997). We employ the ownership ratio of the five top shareholders as the proxy of ownership concentration.

Sustainable corporate development is essential for good corporate performance. Firms with contracted business find it difficult to achieve expected profitability. Managers also make discretionary accounting treatments in terms of their firms' prospects. When they forecast poorer business in the coming year, they may conduct earnings-decrease management in the current year and earnings-increase management in coming year, so that the earnings are smoothed to show a less volatile trend. We use the growth ratio of sales to represent the firm's growth potential.

We employ a dummy variable for firms that issued B shares, while their main equity sources are financed from the domestic A share market. Having foreign investors may mean that the corporate performance and earnings quality is different from those of fully domestically owned firms. We apply a dummy variable for ST firms. Both earnings quality and the corporate performance of ST firms are recognized as being low. We also apply a dummy variable for the state as the largest investor in a firm. State-controlled firms have been criticized for their low efficiency and for having more access to resources and markets.

We use a dummy variable to control for industry difference. CFO and accruals vary significantly from one industry to another. Industry type is an important concern in earnings management research. We also use a dummy variable to control for time differences and for possible macroeconomic policy changes.

The statistics of the controlling variables are summarized in panel C of Table I. The average size of listed firms in the sample studied is 5,700 million Chinese yuan (equivalent to US$863.64 million at the 31st December 2010), which is larger than the values of the median, 25th, and 75th percentiles, and thus shows that most firms are small in size. The leverage is 57.23 percent on average, indicating that more than half of capital is liability. The annual growth of sales is 19.03 percent, although at least 25 percent firms have a negative growth ratio. The state is the largest shareholder in 50.98 percent of listed firms. Approximately 9.81

percent of the listed A share firms also issued B shares. The ST firms comprise approximately 13.48 percent of total listed companies, which implies that financially distressed firms are a considerable proportion of total companies.

Our fundamental regression model to detect the association of earnings quality with corporate performance is as follows:

$$P_{i,t} = \alpha_{i,t} + \beta_{i,t} Q_{i,t} + F'_{i,t}\lambda_{2,t} + I'_{i,t}\lambda_{3,t} + +Y'_{i,t}\lambda_{4,t} + \varepsilon_{i,t} \quad (7)$$

where: *i* indicates a firm and *t* represents a year; *P* is a corporate performance measure that can be either an accounting-based on EBIT or a market-based on Tobin-Q ; *Q* is an earnings quality measure; *F* is a vector of a firm's characteristic variables that include firm size, leverage, ownership status, and so on; *I* is a vector of industry dummy variables in terms of industry classification promulgated by the Chinese Security Regulatory Committee in 1999; *Y* is a vector of yearly dummy variables; and α, β_1, λ_2, λ_3, and λ_4 are coefficients or vectors of relevant coefficients. The cluster effect in standard deviation of errors is corrected at the firm level.

Initial empirical results

Table III summarizes the regression results of the accounting-based measure of corporate performance (EBIT/assets) on earnings quality. Each model specifies an investigation on one type of earnings quality measure associated with corporate performance. We observe that the coefficients of earnings quality measures are negative in all models and at the 5% or 1% significance level. Earnings quality has a negative association with corporate performance.

The positive coefficients of firm size and negative coefficients of leverage ratio are statistically significant at 1 percent, which mirrors many other studies of corporate performance (for example, Ma et al. 2010; Givoly et al. 2010; Firth et al. 2008). Large firms are most likely to have more opportunity for business expansion. High leverage introduces bankruptcy costs and reduces profitability. Ownership by the Top 5 shareholders has a

positive impact on corporate performance and is significant at the 10 percent level, or high for three out of four estimated coefficients. Ownership concentration mitigates agency costs and increases profitability. The growth of sales is highly positively related to corporate performance at better than 1 percent significance. High growth in production and sales are the drives of increasing profitability. ST firms are certainly characterized by low performance due to negative profit. The coefficients of the state as largest shareholder are all negative and three out of four are at 10 percent significance or higher. State ownership, accompanied by lower efficiency, has been observed in many investigations. The foreign ownership of B shares has no influence on corporate performance.

Table III. Regression analyses on corporate performance of EBIT/assets associated with earnings quality

	Model 1	Model 2	Model 3	Model 4
Intercept	-0.0686	-0.0774	-0.1716	-0.0811
	(-1.36)	(-1.47)	(-3.57)***	(-1.55)
Accruals quality	-0.1846			
	(-1.96)**			
Earnings persistence		-0.0108		
		(-4.44)***		
Earnings predictability			-0.2340	
			(-5.91)***	
Discretionary accrual (abs)				-0.1200
				(-2.10)**
Logarithm of assets	0.0066	0.0083	0.0130	0.008
	(2.78)***	(3.51)***	(5.73)***	(3.40)***
Leverage ratio	-0.1461	-0.1368	-0.1641	-0.1395
	(-9.45)***	(-9.06)***	(-11.47)***	(-9.23)***
Top5 ownership	0.0003	0.0003	0.0001	0.0002
	(1.8)*	(2.05)**	(0.36)	(1.98)**
Growth of sales	0.0491	0.0486	0.0417	0.0494
	(8.81)***	(10.36)***	(9.65)***	(10.48)***
ST firm dummy	-0.0547	-0.0404	-0.0477	-0.0433
	(-7.82)***	(-6.15)***	(-7.35)***	(-6.85)***
State dummy	-0.0023	-0.0073	-0.0051	-0.0074
	(-0.66)	(-2.52)**	(-1.76)*	(-2.65)***
B shares dummy	0.0006	0.0012	-0.0007	0.0033
	(0.11)	(0.22)	(-0.13)	(0.64)
Industry dummy				
	Include	Include	Include	Include
Yearly dummy				
	Include	Include	Include	Include
Adjusted R-square (%)				
	21.49	20.19	23.03	19.95

Notes: The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. The sample consists of 1,176 firms with 7,921 firm-year observations. Values in parentheses are t-statistics. *, **, and *** indicate significance at 10%, 5%, and 1% respectively.

We replace the corporate performance measure EBIT/assets with EBIT/sales in our models and report on them in Table IV. The regressions of earnings scaled by sales are almost the same as the regressions of earnings scaled by assets: All coefficients of earnings quality are negative and at the 1% to 10% significance levels. The only difference worthy of notice is that the coefficients of the control variables state dummy and ownership concentration become insignificant. Overall the regression results in Tables III and IV provide empirical evidence that validates our hypothesis one: In an emerging market experiencing an economic boom it is possible that high corporate performance is associated with low earnings quality.

Table IV. Regression analyses on corporate performance of EBIT/sales associated with earnings quality

	Model 1	Model 2	Model 3	Model 4
Intercept	-0.4979	-0.4992	-0.7184	-0.4405
	(-2.45)**	(-2.37)**	(-3.84)***	(-2.08)**
Accruals quality	-0.9394			
	(-2.49)**			
Earnings persistence		-0.0504		
		(-6.06)***		
Earnings predictability			-0.6505	
			(-5.19)***	
Discretionary accrual (abs)				-0.2834
				(-1.68)*
Logarithm of assets	0.0312	0.0379	0.0489	0.0339
	(3.18)***	(4.00)***	(5.72)***	(3.60)***
Leverage ratio	-0.5026	-0.4589	-0.5366	-0.4687
	(-8.65)***	(-7.85)***	(-9.38)***	(-8.04)***
Top5 ownership	0.0004	0.0003	-0.0003	0.0002
	(0.73)	(0.70)	(-0.64)	(0.48)
Growth of sales	0.172	0.1652	0.1468	0.1674
	(7.35)***	(8.39)***	(7.55)***	(8.45)***
ST firm dummy	-0.1489	-0.0872	-0.1043	-0.0898
	(-4.2)***	(-2.48)**	(-2.93)***	(-2.61)***
State dummy	0.0096	-0.0082	-0.0034	-0.0091
	(0.58)	(-0.59)	(-0.24)	(-0.65)
B shares dummy	0.0073	-0.0023	-0.003	0.0067
	(0.31)	(-0.09)	(-0.12)	(0.28)
Industry dummy				
	Include	Include	Include	Include
Yearly dummy				
	Include	Include	Include	Include
Adjusted R-square (%)				
	15.08	13.81	14.40	12.88

Notes: The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. The sample consists of 1,176 firms with 7,921 firm-year observations. Values in parentheses are t-statistics. *, **, and *** indicate significance at 10%, 5%, and 1% respectively.

Empirical results with unmanaged earnings

Low earnings quality associated with high corporate performance may be the consequence of managers' manipulation of earnings. Cornett et al. (2008) define EBIT/assets as a managed corporate performance measure, because it includes discretionary accruals that may be used by management to boost earnings. They employ an unmanaged corporate performance measure that subtracts discretionary accruals from earnings: EBIT/assets – %DA. In addition to borrowing sprite from Cornett et al., we introduce another unmanaged corporate performance measure: CFO/assets + %NDA. We substitute the managed performance measures with unmanaged performance measures in the models to see whether a change occurred in the association between earnings quality and corporate performance when the possible manipulation is removed.

Table V shows the results of regression of EBIT/assets – %DA on earnings quality. Table V and Table III are directly comparable, because the only difference is the discretionary accruals removed from earnings in the dependent variable in Table V. Except that the coefficient of accruals quality becomes insignificant, all coefficients of other earnings quality measures, such as earnings persistence, earnings predictability and discretionary accruals (absolute value), are still negative and statistically significant at 1 to 10 percent convention levels. However, the coefficients become smaller in comparison with those in Table III, and the *t*-values also decrease in absolute value correspondingly. The negative association between earnings quality and corporate performance turns out to be weak when discretionary accruals are removed from managed earnings.

The results of regression of CFO/assets + %NDA on earnings quality are arranged in Table VI. By contrast to those in Table V, the coefficient of earnings persistence becomes insignificant, while the coefficient of accruals quality becomes significant. However, the signs, t-values and magnitudes of coefficients of other earnings quality measures and control

variables are similar, i.e., the estimates in the two tables have no conclusive difference. Thus, we have twofold evidence shown in Tables III and IV for the relationship between earnings quality and managed corporate performance, and shown in Tables V and VI for the relationship between earnings quality and unmanaged corporate performance. Therefore, the empirical evidence supports our hypothesis two: Earnings management may distort earnings quality and manipulate corporate performance upwards to some extent. However, earnings management is not the main driver of high corporate performance and low earnings quality.

Table V. Regression analyses on unmanaged corporate performance of EBIT/assets – %DA associated with earnings quality

	Model 1	Model 2	Model 3	Model 4
Intercept	-0.0372	-0.0402	-0.1418	-0.0505
	(-0.74)	(-0.81)	(-2.89)***	(-1.02)
Accruals quality	-0.1430			
	(-1.43)			
Earnings persistence		-0.0078		
		(-3.47)***		
Earnings predictability			-0.2176	
			(-5.82)***	
Discretionary accrual (abs)				-0.1057
				(-1.97)**
Logarithm of assets	0.0061	0.0069	0.012	0.0069
	(2.59)***	(3.12)***	(5.16)***	(3.10)***
Leverage ratio	-0.1397	-0.1337	-0.1602	-0.1366
	(-9.04)***	(-9.17)***	(-11.17)***	(-9.31)***
Top5 ownership	0.0002	0.0003	0.0001	0.0003
	(1.43)	(2.07)**	(0.62)	(2.00)**
Growth of sales	0.0382	0.0383	0.0319	0.0389
	(6.73)***	(8.18)***	(7.20)***	(8.30)***
ST firm dummy	-0.0484	-0.0384	-0.0444	-0.0413
	(-6.73)***	(-5.69)***	(-6.62)***	(-6.28)***
State dummy	-0.0016	-0.0039	-0.0018	-0.0037
	(-0.43)	(-1.22)	(-0.55)	(-1.19)
B shares dummy	-0.0005	0.001	-0.0024	0.0017
	(-0.08)	(-0.01)	(-0.38)	(0.30)
Industry dummy				
	Include	Include	Include	Include
Yearly dummy				
	Include	Include	Include	Include
Adjusted R-square (%)	15.61	15.05	17.56	15.61

Notes: The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. The sample consists of 1,176 firms with 7,921 firm-year observations. Values in parentheses are t-statistics. *, **, and *** indicate significance at 10%, 5%, and 1% respectively.

Table VI. Regression analyses on unmanaged corporate performance of CFO/Assets + %NDA associated with earnings quality

	Model 1	Model 2	Model 3	Model 4
Intercept	0.0038	0.0431	-0.1051	0.016
	(0.07)	(0.84)	(-2.2)**	(0.31)
Accruals quality	-0.2501			
	(-2.62)***			
Earnings persistence		-0.0023		
		(-0.77)		
Earnings predictability			-0.2874	
			(-6.62)***	
Discretionary accrual (abs)				-0.1816
				(-2.29)**
Logarithm of assets	0.0042	0.003	0.0104	0.0036
	(1.53)	(1.23)	(4.57)***	(1.5)
Leverage ratio	-0.1183	-0.1168	-0.1513	-0.1211
	(-9.89)***	(-9.5)***	(-12.81)***	(-9.91)***
Top5 ownership	0.0006	0.0007	0.0005	0.0007
	(3.84)***	(4.71)***	(3.19)***	(4.58)***
Growth of sales	0.0538	0.0585	0.0494	0.0587
	(5.52)***	(6.11)***	(5.56)***	(6.11)***
ST firm dummy	-0.0418	-0.027	-0.0345	-0.0303
	(-5.38)***	(-3.24)***	(-4.32)***	(-3.8)***
State dummy	-0.0108	-0.0147	-0.0114	-0.0134
	(-2.38)**	(-3.47)***	(-2.83)***	(-3.16)***
B shares dummy	-0.0138	-0.0114	-0.0158	-0.0104
	(-2.12)**	(-1.88)*	(-2.62)***	(-1.74)*
Industry dummy				
	Include	Include	Include	Include
Yearly dummy				
	Include	Include	Include	Include
Adjusted R-square (%)	12.84	11.60	15.47	12.31

Notes: The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. The sample consists of 1,176 firms with 7,921 firm-year observations. Values in parentheses are t-statistics. *, **, and *** indicate significance at 10%, 5%, and 1% respectively.

Empirical results with earnings- increase and earnings-decrease management

We have detected negative relationships between earnings quality and corporate performance in the full sample. It has been suspected that earnings management distorts earnings quality and manipulates earnings upward, and thereby creates a negative association between earnings quality and corporate performance. However, earnings management may be earnings-increase management, in which discretionary accruals should be larger than zero (%DA>0), and earnings-decrease management, in which discretionary accruals should be smaller than zero (%DA≤0). If the negative association results from earnings management,

earnings-increase management and earnings-decrease management should have different effects on corporate performance.

Next we tested whether the two opposite types of earnings management result in similar negative associations between earnings quality and corporate performance. To do so, we split the full sample into 3,979 firm-year observations with %DA>0, and 3,942 firm-year observations with %DA≤0. We ran all the models, except for model 4, for each group of firms. We did not run model 4, because its explanation variable is an absolute value of discretionary accruals. When the sample is structured in terms of positive or negative discretionary accruals, the regression coefficient of absolute value of discretionary accruals may be biased.

To save space, we here only report the estimated coefficients of earnings quality measures in Table VII. In the columns of %DA>0 and %DA≤0 under the dependent variables EBIT/assets and EBIT/sales, all the coefficients are negative and most of them are significant at the 1 to 10 percent levels. Although the absolute values of several earnings quality coefficients or levels of significance in the earnings-increase management columns are larger than those in earnings-decrease management columns, the others are just the opposite, so it is hard to generalize which type of earnings management leads to a more significant negative association between earnings quality and corporate performance.

Similarly, in the columns of %DA>0 and %DA≤0, under the dependent variables of unmanaged earnings EBIT/assets − %DA and CFO/assets + %NDA, all coefficients are negative and most of them are significant at the 1 to 10 percent levels. While we have removed the earnings management component, low earnings quality is still associated with high corporate performance regardless of the possible earnings-increase or earnings-decrease management.

Overall, the results in the columns of EBIT/assets, EBIT/sales, EBIT/assets – %DA and CFO/assets + %NDA in Table VI roughly match those in Tables III, IV, V, and VI respectively. The negative coefficients dominate the earnings quality measures in those tables—most of them significantly at convention levels. The negative association of earnings quality with corporate performance exists in both earnings-increase managed firms and earnings-decrease managed firms, which coincides with our hypothesis three: The association of low earnings quality with high corporate performance is probably an inherent phenomenon of an emerging market. Fast and fluctuating growth leads to the coexistence of low earnings quality and high corporate performance in the emerging market of China.

It seems that earnings-increase management manipulates earnings up and earnings-decrease management manipulates earnings down. Because both types of earnings management distort earnings quality, at the same level of earnings quality, firms with earnings-increase management should have relatively higher corporate performance than firms with earnings-decrease management. However, with firms conducting earnings-increase management this is just because their real earnings are lower than the expected level, whereas, with firms undertaking earnings-decrease management it is most likely that their real earnings are higher than the expected level (Healy 1985). Thus the association of earnings quality and corporate performance is less determined by the direction of earnings management.

Further evidence with ST firms

We review the regression results presented in Tables III, IV, V, and VI and observe that the coefficients of the ST firm dummy variable in all models are negative at the 1 percent significance level. Therefore, it is true that ST firms display a low corporate performance. However, the negative associations between earnings quality and corporate performance have

been observed thoroughly in our empirical evidence. Does this mean that ST firms have higher earnings quality than normal firms? To answer this question, we test the differences between normal firms and ST firms in earnings quality and corporate performance. The summary of results is presented in Table VIII.

It can be seen that all the earnings quality measures of ST firms are lower than normal firms. Furthermore, the corporate performance measures of ST firms are much lower than those of normal firms. For example, the accruals quality, earnings persistence, earnings predictability, and discretionary accruals of ST firms are lower than those of normal firms by 71.46 percent, 9.03 percent, 195.57 percent, and 45.510 percent respectively. In contrast, corporate performance measures of ST firms' EBIT/assets, EBIT/sales, EBIT/assets – %DA and CFO/assets + %NDA are lower than those of normal firms by 257.78 percent, 459.91 percent, 249.12 percent, and 265.56 percent respectively.

The performance of ST firms is much lower than normal firms, while the earnings quality of ST firms is lower or marginally higher than normal firms. Thus, the earnings quality of ST firms is relatively "better" than normal firms using their respective performance as a benchmark. We also repeat the regressions in models 1 to 6 for the samples with only ST firms, and only normal firms, respectively. We obtain all the negative coefficients of earnings quality measures, and most are statistically significant at the 5 percent or 10 percent levels. The results are not reported here, but are available on request. This evidence also supports our two hypotheses. Although earnings management and financial distress draw earnings quality down, they are not the principal factors that determine the negative association between earnings quality and corporate performance.

Table VII. Regression analyses on corporate performance associated with the earnings quality for firms with positive and negative discretionary accruals respectively

Dependent variable	EBIT/assets		EBIT/sales		EBIT/assets – %DA		CFO/assets + %NDA	
	%DA>0	%DA≤0	%DA>0	%DA≤0	%DA>0	%DA≤0	%DA>0	%DA≤0
Accruals quality	–0.2053	–0.1389	–1.0199	–0.7377	–0.1398	–0.4769	–0.4174	–0.0245
	(–2.18)**	(–0.92)	(–2.45)***	(–1.39)	(–1.48)	(–3.49)***	(–2.80)***	(–0.24)
Earnings persistence	–0.0032	–0.0144	–0.0318	–0.0569	–0.0018	–0.0132	–0.0022	–0.0057
	(–1.20)	(–4.20)***	(–4.09)***	(–4.77)***	(–0.68)	(–4.04)***	(–0.42)	(–1.90)*
Earnings predictability	–0.2347	–0.2088	–0.6234	–0.6627	–0.19164	–0.2478	–0.4541	–0.0970
	(–4.59)***	(–3.35)***	(–3.83)***	(–3.13)***	(–4.34)***	(–3.84)***	(–6.59)***	(–1.67)*

Notes: The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. The sample consists of 1,176 firms with 7,921 firm-year observations of which 3,979 have positive discretion accruals and 3,942 have negative discretion accruals. The coefficients of intercepts and control variables are not reported. Values in parentheses are t-statistics. *, **, and *** indicate significance at 10%, 5%, and 1% respectively.

Table VIII. The differences of corporate performance and earnings quality between normal firms and ST firms

	ST firms	Normal firms	Difference	%Difference	t-statistics	Wilcoxon test
Panel A: Earnings quality measures						
Accruals quality	–0.0655	–0.0382	–0.0273	–71.46%	–2.94***	–11.92***
Earnings persistence	0.3386	0.3722	–0.0336	–9.03%	–0.90	–7.94***
Earnings predictability	–0.1336	–0.0452	–0.0884	–195.57%	–20.44***	–29.77***
Discretionary accrual (abs)	–0.0711	–0.0492	–0.0219	–45.51%	–9.90***	–7.24***
Panel B: Corporate performance measures						
EBIT/assets	–0.0639	0.0405	–0.1044	–257.78%	–8.52***	–25.41***
EBIT/sales	–0.2397	0.0666	–0.3063	–459.91%	–9.26***	–20.76***
EBIT/assets – %DA	–0.0595	0.0399	–0.0994	–249.12%	–5.53***	–18.62***
CFO/assets + %NDA	–0.0500	0.0302	–0.0802	–265.56%	–2.95***	–17.69***

Notes: The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. The sample consists of 1,176 firms with 7,921 firm-year observations of which 1,068 are on ST firms and 6,853 are on normal firms. *, **, and *** indicate significance at 10%, 5%, and 1% respectively.

Robustness tests

In the robustness tests, we replace the accounting-based measures of corporate performance with the market-based measure of corporate performance Tobin-Q. Table IX represents the results of regression on Tobin-Q1, which is the ratio of market value of total shares outstanding plus net book value of liability divided by book value of equity plus net book value of liability. If we compare Table IX with Tables III to IV, the regression results on accounting-based measures of corporate performance, we find that only the coefficient of earnings persistence becomes positive, though insignificant. All other coefficients of earnings quality remain negative and are significant at convention levels. The results assert that low earnings quality is associated with high corporate performance according to both accounting-based and market-based measures.

However, we argue that earnings quality and accounting-based measures of corporate performance are directly determined. When a company experiences fluctuating growth, high corporate performance and low earnings quality should be reflected in accounting data simultaneously. The earnings quality and market-based measures of corporate performance are indirectly related. The investors' attitude to the accounting data is a key which shows that how the market responds to the earnings quality. For example, because of the coexistence of companies' fluctuating growth and low earnings quality, if investors are more concerned about firms' earnings growth than their earnings quality, the positive relation between firms' earnings growth and market-based measures of corporate performance, and the negative relation between earnings quality and market-based measures of corporate performance, should coexist.

Interestingly, the coefficients and significance levels of several control variables in Table IX are different from the relevant ones in Tables III to VI. For example, the firm size (Logarithm of assets) has a negative coefficient in Table IX, while it has positive coefficients

in Tables III to VI. The negative coefficient of firm size in Table IX is probably evidence of the small firm effect put forward by Fama and MacBeth (1973). The coefficient of ST firm is positive in Table IX, but negative in Tables III to VI. The reason is that when a firm is becoming distressed before falling into the ST category, the market evaluates this firm negatively. When a firm has been classified ST, the possibility of, or released news regarding, merger, restructure and government assistance always pushes the market price up. The difference in the coefficients of other relevant control variables between regressions of accounting-based measures and market-based measures may be explained by market efficiency and behavioural finance theories, which is beyond the scope of this paper.

Table IX. Regression analyses on corporate performance of Tobin-Q1 associated with earnings quality

	Model 1	Model 2	Model 3	Model 4
Intercept	16.304	18.6144	17.2809	18.029
	(17.13)***	(19.19)***	(17.55)***	(20.24)***
Accruals quality	-3.3340			
	(-3.76)***			
Earnings persistence		0.0303		
		(1.49)		
Earnings predictability			-2.4344	
			(-4.16)***	
Discretionary accrual (abs)				-1.6934
				(-3.05)***
Logarithm of assets	-0.7644	-0.8001	-0.7336	-0.7783
	(-16.07)***	(-17.3)***	(-15.5)***	(-18.16)***
Leverage ratio	0.7159	0.7666	0.4824	0.7495
	(3.24)***	(3.36)***	(2.05)**	(3.43)***
Top5 ownership	0.0120	0.0069	0.0047	0.0065
	(5.07)***	(3.04)***	(2.22)***	(2.87)***
Growth of sales	0.0796	0.1201	0.0391	0.1141
	(4.45)***	(4.03)***	(3.95)***	(4.05)**
ST firm dummy	0.2118	0.3528	0.2891	0.3126
	(1.82)*	(2.84)***	(2.51)**	(2.55)**
State dummy	-0.0228	-0.2475	-0.2159	-0.2384
	(-4.41)***	(-4.70)***	(-4.14)***	(-4.56)***
B shares dummy	0.5813	0.5738	0.5285	0.5716
	(1.68)*	(2.45)**	(0.77)	(2.34)**
Industry dummy				
	Include	Include	Include	Include
Yearly dummy				
	Include	Include	Include	Include
Adjusted R-square (%)	44.55	38.82	40.56	38.65

Notes: The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. The sample consists of 1,176 firms with 7,921 firm-year observations. Values in parentheses are t-statistics. *, **, and *** indicate significance at 10%, 5%, and 1% respectively.

Table X represents the results of regression on Tobin-Q2. The equity value is the market value of total shares in the numerator of Tobin-Q1, whereas the equity value is the market value of tradable shares plus book value of nontradable shares in the numerator of Tobin-Q2. Tobin-Q1 may overstate market performance and the Tobin-Q2 may understate market performance, considering that equity market value is higher than equity book value overall. Nevertheless, the coefficients of earnings quality measures in Table X are similar to those in Table IX, regardless of the difference in some control variables.

Table X. Regression analyses on corporate performance of Tobin-Q2 associated with earnings quality

	Model 1	Model 2	Model 3	Model 4
Intercept	9.9493 (15.46)***	12.0605 (17.73)***	11.4961 (17.19)***	11.7092 (18.79)***
Accruals quality	-1.8516 (-2.84)***			
Earnings persistence		0.0110 (0.83)		
Earnings predictability			-1.0364 (-2.87)***	
Discretionary accrual (abs)				-0.8175 (-2.17)**
Logarithm of assets	-0.4200 (-13.04)***	-0.4606 (-14.45)***	-0.4325 (-13.61)***	-0.4468 (-15.23)***
Leverage ratio	0.1460 (1.02)	0.1494 (0.97)	0.0283 (0.19)	0.1437 (0.96)
Top5 ownership	-0.0036 (-2.19)**	-0.0075 (-4.71)***	-0.0084 (-5.3)***	-0.0077 (-4.87)***
Growth of sales	0.0258 (3.60)***	0.0570 (3.48)***	0.0226 (3.37)***	0.0536 (3.49)***
ST firm dummy	0.0951 (1.46)	0.1482 (1.99)**	0.1210 (1.67)*	0.1277 (1.74)*
State dummy	-0.0740 (-2.13)**	-0.3049 (-8.73)***	-0.2915 (-8.37)***	-0.3031 (-8.78)***
B shares dummy	0.2903 (0.85)	0.2899 (1.66)*	0.2709 (0.62)	0.2880 (1.56)
Industry dummy	Include	Include	Include	Include
Yearly dummy	Include	Include	Include	Include
Adjusted R-square (%)	42.73	35.13	35.83	34.84

Notes: The description of earnings quality measures and corporate performance measures is in section 3. The description of control variables is in section 4. The sample consists of 1,176 firms with 7,921 firm-year observations. Values in parentheses are t-statistics. *, **, and *** indicate significance at 10%, 5%, and 1% respectively.

In the robustness tests, we also follow the approach of Francis et al. (2004) in ranking the value of each quality each year to form deciles. Because high raw values of accruals quality, earnings predictability, earnings smoothness, and discretionary accruals correspond to low earnings quality, we rank the deciles for these four measures in descending order. Meanwhile, because high raw values in earnings persistence correspond to high earnings quality, we rank the deciles for earnings persistence in ascending order. Thus, a firm in the top decile (decile 10) has the highest earnings quality, and a firm in the bottom decile (decile 1) has the lowest earnings quality.

We replaced the values of each earnings quality measure with relevant deciles and then repeated the regression analyses. The results by decile-approach are somewhat dissimilar to those by value-approach in Tables III to VIII. First, the significance of many coefficients of earnings quality measure declines, but most are still at the convention level of 10 percent or 5 percent. Second, the signs of a few coefficients change. For example, with the regression of EBIT/assets, the coefficient *t*-values of accruals quality and earnings persistence decrease in absolute value from −1.96 to −1.78, and from −4.44 to −2.11 respectively. With the regression of EBIT/sales, the coefficient *t*-value of absolute discretionary accruals becomes 1.12 from a previous −1.88. However, negative and statistically significant at convention levels are the main characteristics of the coefficients of earnings quality measures in the regressions that use deciles. The prior detected negative association between earnings quality and corporate performance still holds in the robustness tests ─ it does not qualitatively change. To save space, we do not report the robustness test results here, but they are available on request.

Finally, we borrow the spirit of Dechow and Dichev (2002) and Francis et al. (2005), which decomposes accruals quality into innate accruals quality (InnateAQ) and discretionary accruals quality (DisAQ). The innateAQ is derived from firms' operational characteristics

represented by firms' innate factors: firm size, standard deviation of cash flow, standard deviation of sales revenues, length of operating cycle and the appearances of negative earnings. We conduct regression of accruals quality on firms' innate factors and obtain the fitted value of innateAQ[3]. We, therefore, repeat the regression of the model by replacing earnings quality measures with the innateAQ. We find that the innateAQ is positive in the regression on managed earnings (EBIT/assets and EBIT/sales) and negative in the regression on unmanaged earnings (CFO/assets + %NDA and EBIT/assets - %DA). In particular, the coefficients of EBIT/sales and EBIT/assets - %DA are statistically at 1% significance. The results imply that firms' operating characteristics may be negative to earnings quality in the Chinese context in which firms have high growth in sales and earnings, which is likely to be consistent with our main argument.

5. Conclusion

Earnings quality is an important concern for managers and investors because it conveys information about firms' operational and financial status. The mainstream of theoretical analyses asserts that earnings quality has a positive association with corporate performance. Low earnings quality implies either high risk, which increases the cost of capital, or information bias, which leads to incorrect managerial decisions. However, empirical evidence does not always support the theoretical conclusion (Chan et al., 2006; Penman and Zhang, 2002). In particular, we find a negative association with corporate performance for publicly listed companies in the Chinese market.

To obtain reliable evidence, we employ four attributes of earnings as earnings quality measures: accruals quality, earnings persistence, predictability and discretionary accruals. We use four corporate performance measures: earnings before interest and tax scaled by total assets, earnings before interest and tax scaled by sales, earnings before interest and tax less

discretionary accruals then scaled by total assets, and cash flow plus nondiscretionary accruals then scaled by total assets. The last two corporate performance measures are assumed to exclude the earnings management effect.

Our regression results show that, when the corporate performance measures include discretionary accruals, the earnings management component, all the coefficients of the earnings quality measures are negative and significant at the convention level. When the effect of the earnings management component is removed from the corporate performance measures, three out of four coefficients of the earnings quality measures are negative and significant at convention levels. Our further analyses on the subsamples of earnings-increase management firms and earnings-decrease management firms, as well as financially distressed (ST) firms, provide almost consistent results. The robustness tests using the market-based performance measure of Tobin-Q, and using the decile ranking of earnings quality, do not generate significantly different results.

The negative association of earnings quality with corporate performance seems a puzzle in terms of the most frequently cited literature. We argue that earnings quality is a joint function of financial reporting accuracy and fundamental corporate performance (Dechow et al., 2010). In particular, the earnings quality measures represented by the coefficients and forecast errors are determined by the deviation of reporting earnings from the benchmark earnings, i.e.: reported earnings – benchmark earnings = (reported earnings – real earnings) + (real earnings – benchmark earnings). The former component results from earnings management and the latter from corporate operations.

In an emerging market experiencing an economic boom, many firms experience high volatility and rapid growth of earnings. Although earnings management is likely used to inflate earnings upwards for some firms, earnings management is not the primary cause of the negative association between earnings quality and corporate performance. Instead, the highly

volatile and rapid growth of firms' earnings is the main driver of the negative association of earnings quality with corporate performance. Low earnings quality and high corporate performance are an inherent phenomenon in a period of fast economic development in the emerging market of China.

Notes:

[1] Theoretically, because EBIT = CFO + nondiscretionary accruals + discretionary accruals, then EBIT/assets – %DA = CFO/assets + %NDA. Actually, due to the time variance of accounting data entries and accounting issues recognition, EBIT/assets – %DA is not equal to CFO/assets + %NDA. However, they are closely correlated. We employed both for more robust evidence.

[2] China's stock market comprises A and B shares. A shares are accessible by Chinese investors. B shares were accessible by foreign investors before 2001, and by all investors thereafter.

[3] The standard deviation of cash flow, standard deviation of sales and appearances of negative earnings are calculated by a rolling five-year window due to the short history of the Chinese stock market.

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Reference

Ball, R. and Brown, P. (1967), "Some preliminary findings on the association between the earnings of a firm, its industry, and the economy", *Journal of Accounting Research*, Vol. 5, pp. 55–80.

Ball, R. and Brown, P. (1968), "An empirical evaluation of accounting income numbers", *Journal of Accounting Research*, Vol. 6, pp. 159–178.

Boonlert-U-Thai, K.., Meek, G. and Nabar, S. (2006), "Earnings attributes and investor-protection: International evidence", *The International Journal of Accounting*, Vol. 41, pp. 327–357.

Bushman, M., Chordia, T. and Subrahmanyam, A. (2004), "Financial information, organizational complexity, and corporate governance systems", *Journal of Accounting and Economics*, Vol. 37, pp. 139–201.

Chan, K.., Chan, L., Jegadeesh, L. and Lakonishok, J. (2006), "Earnings Quality and Stock Returns", *Journal of Business*, Vol. 79, pp. 1041–1082.

Collins, D., Maydew, E. and Weiss, I. (1997), "Change in the value-relevance of earnings and book values over the past forty years", Journal *of Accounting and Economics*, Vol. 24, pp. 39–67.

Cornett, M. M., Marcus, A. J. and Tehranian, H. (2008), "Corporate governance and pay-for-performance: The impact of earnings management", *Journal of Financial Economics*, Vol. 87, pp. 357–373.

Dechow, P., and Dichev, D. (2002), "The quality of accruals and earnings: The role of accruals estimation errors", *The Accounting Review*, Vol. 77 (Supplement), pp. 35–59.

Dechow, P. and Schrand, C. (2004), "*Earnings Quality*", Research Foundation of CFA Institute.

Dechow, P., Ge, W. and Schrand, M. (2010), "Understanding earnings quality: A review of the proxies, their determinants, and their consequence", *Journal of Accounting and Economics*, Vol. 50, pp. 344–401.

Dechow, P., Sloan, R. and Sweeney, A. (1995), "Detecting earnings management", *The Accounting Review*, Vol. 70, pp. 193–225.

Dichev, I. and Tang, W. (2009), "Earnings volatility and earnings predictability", *Journal of Accounting and Economics*, Vol. 47, pp. 160–181.

Fama, E. and MacBeth, J. (1973), "Risk, return, and equilibrium: empirical tests", *Journal of Political Economy*, Vol. 81, pp. 607–636.

Firth, M., Lin, C. and Wong, S. (2008), "Leverage and investment under a state-owned bank lending environment: Evidence from China", *Journal of Corporate Finance*, Vol. 14, pp. 642–653.

Francis, J. and Schipper, K. (1999), "Have financial statements lost their relevance?", *Journal of Accounting Research*, Vol. 37, pp. 319−352.

Francis, J., LaFond, R., Olsson, P. and Schipper, K. (2004), "Costs of equity and earnings attributes", *The Accounting Review*, Vol. 79, pp. 967−1010.

Francis, J., LaFond, R., Olsson, P. and Schipper, K. (2005), "The market pricing of accruals quality", *Journal of Accounting and Economics*, Vol. 39, pp. 295–327.

Francis, J., Olsson, P. and Schipper, K. (2006), "Earnings quality", *Foundation and Trends in Accounting*, Vol. 1, pp. 259–340.

Givoly, D., Hayn, K. H. and Sharon, P. K. (2010), "Does public ownership of equity improve earnings quality? ", *The Accounting Review*, Vol. 85, pp. 195–225.

Healy, P. (1985), "The impact of bonus schemes on the selection of accounting principles", *Journal of Accounting and Economics*, Vol. 7, pp. 85-107.

Healy, P. and Wahlen, J. (1999), "A review of the earnings management literature and its implications for standard setting", *Accounting Horizons*, Vol. 13, pp. 365–383.

Heugens, P. M. A. R., Essen, M. V. and Oosterhout, J. V. (2009), "Meta-analyzing ownership concentration and firm performance in Asia: Towards a more fine-grained understanding", *Asia Pacific Journal of Management*, Vol. 26, pp. 481–512.

Hodge, F. (2003), "Investors' perceptions of earnings quality, auditor independence, and the usefulness of audited financial information", *Accounting Horizons*, pp. 37–48.

Jones, J. (1991), "Earnings management during important relief investigations", *Journal of Accounting Research*, Vol. 29, pp. 193–228.

Kirschenheiter, M. and Melumad, N. (2004), "Can 'big bath' and earnings smoothing co-exist as equilibrium financial reporting strategies?", *Journal of Accounting Research*, Vol. 40, pp. 761–796.

Kormendi, R. and Lipe, R. (1987), "Earnings innovations, earnings persistence, and stock returns", *Journal of Business*, Vol. 60, pp. 323–345.

Kothari, S. P., Leone, A. J. and Wasley, C. E. (2005), "Performance matched discretionary accrual measures", *Journal of Accounting and Economics*, Vol. 39, pp. 163–197.

Ma, S., Naughton, T. and Tian, G. (2010), "Ownership and ownership concentration: Which is important in determining the performance of China's listed firms?", *Accounting and Finance*, Vol. 50, pp. 871–897.

McNichols, M. and Stubben, S. (2008), "Does earnings management affect firms' investment decisions", *The Accounting Review*, Vol. 83, pp. 1571–1603.

Penman, S. and Zhang, X. "Accounting conservatism, the quality of earnings, and stock returns", *The Accounting Review*, Vol. 77, pp. 237–264.

Revsine, L., Collins, D. and Johnson, W. B. (1999), "*Financial Reporting and Analysis*", Upper Saddle River, NJ: Prentice Hall.

Richardson, S., Sloan, R., Soliman, M. and Tuna, I. (2005), "Accrual reliability, earnings persistence and stock prices", *Journal of Accounting and Economics*", Vol. 39, No. 3, pp. 437–485.

Richardson, S., Sloan, R., Soliman, M. and Tuna, I. (2006), "The implications of accounting distortions and growth for accruals and profitability", *The Accounting Review*, Vol. 81, No. 3, 713–743.

Schipper, K. and Vincent, L. (2003), "Earnings quality", *Accounting Horizon*, Vol. 17, Supplement , pp. 97–111.

Shleifer, A. and Vishny, R. (1986), "Large shareholders and corporate control", *Journal of Political Economy*, Vol. 94, No. 3, pp. 461–488.

Shleifer, A. and Vishny, R. (1997), "A survey of corporate governance", *Journal of Finance*, Vol. 52, No. 2, pp. 737–783.